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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,001	07/25/2003	Matthew F. Davis	AMAT/7938/ETCH/SILICON/JB	3943
44182	7590	07/14/2005		
MOSER, PATTERSON & SHERIDAN, LLP APPLIED MATERIALS INC 595 SHREWSBURY AVE SUITE 100 SHREWSBURY, NJ 07702			EXAMINER STEVENSON, ANDRE C	
			ART UNIT 2812	PAPER NUMBER

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,001

Applicant(s)

DAVIS ET AL.

Examiner

Andre' C. Stevenson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) 23-26, 56-59 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-22 and 39-55 is/are allowed.
- 6) ☒ Claim(s) 1-8, 27-38, 60 and 61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY

PRIMARY PATENT EXAMINER

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/30/03.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Information Disclosure Statement

The information disclosure statement (IDS) submitted on October 30, 2003 was filed before the mailing date of the first action on the merits. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Election/Restrictions

Applicant's election without traverse of Group I, claims #1-22, 27-55, 60 and 61, in the reply filed on April 21, 2005 is acknowledged.

Claims 23-26 and 56-59 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 21, 2005.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the

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reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-8, 27-38, 60 and 61 are rejected under 35 U.S.C. 102(e) as being anticipated by Reitman (U.S. Pat. No. 6,420,194, Pat. Date 07/16/02, File 07/14/00).

Reitman substantially shows, in figures 1-25 and corresponding text, in a similar method for forming integrated circuits, with respect to **claim #1**, method of evaluating a processing chamber, comprising: performing a substrate processing operation (**item #12**) and a process perturbation operation in a process chamber (**item #14**); collecting optical emission spectroscopy (OES) data and radio frequency (RF) data during the substrate processing operation and the process perturbation operations; and performing a multivariate analysis on the collected OES and RF data from the process chamber (**column #1, line 51-65; column #4, line 13-33; column #11, line 4-15**). *Pertaining to claim #2*, Reitman shows a method, wherein the multivariate analysis comprises principle component analysis (PCA) (**column #1, line 51-65; column #4, line 13-33; column #11, line 4-15**). *Pertaining to claim #3*, Reitman shows a method further comprising: determining if the OES and/or RF data need to be manipulated; performing the data manipulation (**column #3, line 49-61; column #4, line 13-33**); and performing a multivariate analysis on the revised OES and RF data from the chamber (**column #1, line 51-65; column #11, line 4-15**). *Pertaining to claim #4*, Reitman shows a method wherein steady principle components and transitional principle components are identified for the process chamber by principle component analysis (**column #1, line 51-65; column #4, line 13-33; column #11, line 4-15**). *Pertaining to claim #5*, Reitman shows a method further comprising: using

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decomposition of an OES and RF data matrix to yield scores of principle components to determine if the OES and/or RF data need to be manipulated (**column #11, line 4-15, line 37-62**). *Pertaining to claim #6*, Reitman shows a method further comprising: enhancing [[the]] weak signals either by amplifying post perturbation signals, or by selecting a narrower and more sensitive wavelength range or frequency range (**column #13, line 17-35; column #4, line 1-12**).

Pertaining to claim #7, Reitman shows a method further comprising: using a result of the multivariate analysis to calibrate the process chamber or calibrate another process chamber (**column #5, line 36-49; column #3, line 62-67**). *Pertaining to claim #8*, Reitman shows a method further comprising: using a result of the multivariate analysis to identify a fault in the process chamber or identify a fault in another process chamber (**column #5, line 36-49; column #3, line 62-67**). *Pertaining to claim #27*, Reitman shows a method further comprising using a result of the multivariate analysis to calibrate the process chamber or calibrate another process chamber (**column #3, line 62-67; column #5, line 36-49**). *Pertaining to claim #28*, Reitman shows a method further comprising using a result of the multivariate analysis to identify a fault in the process chamber or identify a fault in another process chamber (**column #5, line 36-49; column #3, line 62-67**). *Pertaining to claim #29*, Reitman shows a method of evaluating a processing chamber, comprising: performing a substrate processing operation, followed by a process perturbation operation of the substrate process operation in the process chamber; collecting data of one or more plasma attributes during the substrate processing operation and the following process perturbation operation; and performing a multivariate analysis on the collected data of plasma attributes (**column #1, line 51-65; column #3, line 15-34; column #4, line 1-12**).

Pertaining to claim #30, Reitman shows a method wherein the one or more plasma attributes are

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selected from the group consisting of optical electromagnetic emission, RF power, wafer reflectance, process pressure, process temperature, and the combinations thereof (**column #1, line 59-65; column #3, line 15-34**). *Pertaining to claim #31*, Reitman shows a method wherein the one or more plasma attributes are optical electromagnetic emission, RF power, and wafer reflectance (**column #3, line 15-34**). *Pertaining to claim #32*, Reitman shows a method wherein the plasma attribute is wafer reflectance (**column #3, line 50-61**). *Pertaining to claim #33*, Reitman shows a method wherein the multivariate analysis comprises principle component analysis (PCA) (**column #1, line 51-65; column #4, line 13-33; column #11, line 4-15**).

Pertaining to claim #34, Reitman shows a method further comprising: determining if the data of plasma attributes need to be manipulated; performing data manipulation on the data of plasma attributes that are identified to need data manipulation; and performing a multivariate analysis on the revised data of plasma attributes (**column #1, line 51-65; column #11, line 4-15**). *Pertaining to claim #35*, Reitman shows a method wherein steady principle components and transitional principle components are identified for the process chamber by principle component analysis (**column #1, line 51-65; column #4, line 13-33; column #11, line 4-15**). *Pertaining to claim #36*, Reitman shows a method further comprising: using decomposition of a plasma attributes data matrix to yield scores of principle components to determine if the data of plasma attributes need to be manipulated (**column #11, line 4-15, line 37-62**). *Pertaining to claim #37*, Reitman shows a method further comprising: enhancing weak signals either by amplification, or by selecting a narrower and more sensitive wavelength range or frequency range (**column #13, line 17-35; column #4, line 1-12**). *Pertaining to claim #38*, Reitman shows a method further comprising: using a result of the multivariate analysis to identify a fault in the process chamber

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or to identify a fault in another process chamber (**column #5, line 36-49; column #3, line 62-67**). *Pertaining to claim #60*, Reitman shows a method further comprising, using a result of the multivariate analysis to calibrate the process chamber or calibrate another process chamber (**column #5, line 36-49; column #3, line 62-67**). *Pertaining to claim #61*, Reitman shows a method further comprising, using a result of the multivariate analysis to identify a fault in the process chamber or identify a fault in another process chamber (**column #5, line 36-49; column #3, line 62-67**).

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: The prior art fails to show, either alone or in combination, performing a second multivariate analysis on the collected OES and RF data from the chamber under study to produce second multivariate analysis results; and comparing the second multivariate analysis results from the chamber under study to the first multivariate analysis results from the reference chamber.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 9 through 22 and 39 through 55 are allowed.

Claim #9

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- Performing a second multivariate analysis on the collected OES and RF data from the chamber under study to produce second multivariate analysis results; and comparing the second multivariate analysis results from the chamber under study to the first multivariate analysis results from the reference chamber.

Claim #39

- Performing a multivariate analysis on the revised data of plasma attributes of the process chamber under study to produce second multivariate analysis results; comparing the second multivariate analysis results from the chamber under study to the first multivariate analysis results from the reference chamber.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure; Chang et al. (U.S. Pub. No. 2005/0019964, Moran (U.S. Pub. No. 5,986,747), Kornblit et al. (U.S. Pub. No. 6,021,215).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre' Stevenson whose telephone number is (571) 272 1683. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:30 pm.

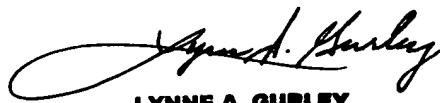
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272 1873. The fax phone number for the organization where this application or proceeding is assigned is (703) 308 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956. Also, the proceeding numbers can be used to fax information through the Right Fax system;

(703) 872-9306

Andre' Stevenson

07/08/05


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812